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EXAMINER	
LE, DUY K	

ART UNIT	PAPER NUMBER
2685	3

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/066,141	TAYLOR, RICHARD DUANE	
	Examiner	Art Unit	
	Duy K Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-9, 11-17, and 19-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Vandegraaf (U.S. Patent 5,450,622).

As to claim 1, Figure 2 in Vandegraaf shows a squelch circuit (20') comprising:

an audio-removal filter coupled to receive an audio signal, the passband of the audio-removal filter being selected sufficiently high relative to frequency components of the audio signal ("the signal from a radio receiver FM demodulator 10 is typically filtered by a high-pass filter or band-pass filter 12 to extract the above-audio band noise. This noise signal is amplified by the noise amplifier 14 and rectified by noise rectifier 16 to produce a DC voltage output" (Col. 2, lines 9-14));

an absolute value detector (16) coupled to the audio-removal filter to supply an output signal having a positive polarity regardless of the polarity of the signal supplied by the audio-removal filter ("the signal from a radio receiver FM demodulator 10 is typically filtered by a high-pass filter or band-pass filter 12 to extract the above-audio band noise. This noise signal is amplified by the noise amplifier 14 and rectified by noise rectifier 16 to produce a DC voltage output" (Col. 2, lines 9-14). "The detected noise signal, V_{in}, from the output of the noise rectifier

16 is applied to the inverting input 28 of operational amplifier (op-amp) U1 via resistor R1" (Col. 4, lines 44-46));

an integrating filter (U1) coupled to receive the output signal from the absolute value detector and supply an integrated signal, the integrating filter having at least one selectable filter coefficient indicative of the response time of the integrating filter ("with the parallel combination of resistor R4 and capacitor C1 in a feedback path from output to inverting input, op-amp U1 functions as a limited low-frequency gain integrator and, thus, also operates as a low-pass filter" (Col. 4, lines 46-50). See also Col. 4, line 46 to Col. 5, line 24); and

a control module (50) configured to select a first value for the selectable filter coefficient so that during a first mode of operation of the squelch circuit the response time of the integrating filter is sufficiently fast to determine the power level of the integrated signal over a predefined time interval relative to respective squelch thresholds (see Col. 5, line 25 to Col. 6, line 16), the control module further configured to select a second value for the selectable filter coefficient so that during a second mode of operation subsequent to the first mode of operation the response time of the integrating filter is sufficiently slow to smooth out power level variations, if any, due to fading of the audio signal (see Col. 6, lines 17-48).

As to claims 3, 11, and 19, the Vandegraaf reference discloses a radio receiver configured to operate in a scanning mode including scanning of a priority channel, said radio comprising the squelch circuit of claim 1 ("the improved squelch circuit is especially applicable to FM receivers operating in a power saving or intermittent mode and can also be used advantageously in scanning receivers where it is desirable to have the squelch operate as rapidly as possible" (Col. 1, lines 14-18). "For a scanning receiver or for a priority search application, the receiver is

permanently turned but "peeks" at a priority channel to check if that channel is active by changing channels momentarily" (Col. 7, lines 51-54)).

As to claims 4, 12, and 20, the Vandegraaf reference discloses when the radio receiver is commanded to start scan of the priority channel, the value of the filter coefficient is selected to provide a relatively fast integration time (see Col. 5, line 52 to Col. 6, line 16).

As to claims 5, 13, and 21, the Vandegraaf reference discloses when the radio receiver is commanded to start scan of the priority channel, the value of the filter coefficient is selected to a value appropriate for performing a relatively fast squelch determination over the predefined time interval (see Col. 5, line 52 to Col. 6, line 16).

As to claims 6, 14, and 22, the Vandegraaf reference discloses the respective squelch thresholds comprise a first squelch threshold value for determining the presence of an audio signal likely to be intelligible upon comparison with the integrated signal supplied by the integrating filter, and a second squelch threshold value for determining absence of the audio signal upon comparison with the integrated signal supplied by the integrating filter, and wherein the value of the first threshold value is lower relative to the second threshold value (see Col. 6, lines 11-48).

As to claims 7, 15, and 23, the Vandegraaf reference discloses when the power level of the integrated signal is below the first threshold value upon completion of the predefined time interval, the radio receiver remains on the priority channel, and the value of the filter coefficient is switched to provide a relatively slow integration time (see Col. 6, lines 17-48).

As to claims 8, 16, and 24, the Vandegraaf reference discloses when the power level of the integrated signal exceeds the second threshold value upon completion of the predefined time

interval, the radio receiver leaves the priority channel until a new priority channel scan is performed ("at the end of a received transmission, the detected noise will exceed the new threshold. Switch S2 is then opened, and switch S1 is closed to reinitialize the squelch control circuit" (Col. 6, lines 44-48). "When the radio receiver is first powered up or when a scanning receiver is acquiring a new channel, switch S1 is initially maintained in the closed position and switch S2 is kept open" (Col. 5, lines 52-55)).

As to claims 9 and 17, Figure 2 in Vandegraaf discloses a method and a computer-readable medium including instructions for squelch control in a radio receiver ("the initializing of the integrator output and the changing of the noise comparator threshold level are each accomplished under microprocessor control via electronic switches" (Col. 3, lines 37-40). "The additional programming of a microcontroller to accomplish the few added switching and timing functions of the present invention (e.g., as a part of the typical signal acquisition or control module of such computer program) would be well within the level of ordinary skill in this art" (Col. 3, lines 45-51)), the method and medium comprising:

filtering an audio signal with a bandpass sufficiently high relative to frequency components of the audio signal ("the signal from a radio receiver FM demodulator 10 is typically filtered by a high-pass filter or band-pass filter 12 to extract the above-audio band noise. This noise signal is amplified by the noise amplifier 14 and rectified by noise rectifier 16 to produce a DC voltage output" (Col. 2, lines 9-14));

generating an output signal having a positive polarity regardless of the polarity of the signal obtained through the audio filtering action ("the signal from a radio receiver FM demodulator 10 is typically filtered by a high-pass filter or band-pass filter 12 to extract the

above-audio band noise. This noise signal is amplified by the noise amplifier 14 and rectified by noise rectifier 16 to produce a DC voltage output" (Col. 2, lines 9-14). "The detected noise signal, V_{in}, from the output of the noise rectifier 16 is applied to the inverting input 28 of operational amplifier (op-amp) U1 via resistor R1" (Col. 4, lines 44-46));

providing an integrating filter coupled to receive the positive polarity signal and supply an integrated signal, the integrating filter having at least one selectable filter coefficient indicative of the response time of the integrating filter ("with the parallel combination of resistor R4 and capacitor C1 in a feedback path from output to inverting input, op-amp U1 functions as a limited low-frequency gain integrator and, thus, also operates as a low-pass filter" (Col. 4, lines 46-50). See also Col. 4, line 46 to Col. 5, line 24);

selecting a first value for the selectable filter coefficient so that during a first mode of operation the response time of the integrating filter is sufficiently fast to determine the power level of the integrated signal over a predefined time interval relative to respective squelch thresholds (see Col. 5, line 25 to Col. 6, line 16); and

selecting a second value for the selectable filter coefficient so that during a second mode of operation subsequent to the first mode of operation, the response time of the integrating filter is sufficiently slow to smooth out power level variations, if any, due to fading of the audio signal (see Col. 6, lines 17-48).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,450,622 to Vandegraaf in view of Verreault (U.S. Patent 6,694,010).

As to claims 2, 10, and 18, the Vandegraaf reference discloses the squelch circuit of claims 1, 9, and 17. However, it does not disclose the integrating filter comprises a recursive filter having a Z-domain transfer function defined by the following equation, $H(z) = 1 - a / 1 - a*z^{-1}$,wherein a is the selectable filter coefficient. The Verreault reference teaches the integrating filter comprises a recursive filter having a Z-domain transfer function defined by the following equation, $H(z) = 1 - a / 1 - a*z^{-1}$,wherein a is the selectable filter coefficient (see Col. 4, lines 36-50).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the squelch circuit, method, and computer-readable medium of Vandegraaf wherein the integrating filter comprises a recursive filter having a Z-domain transfer function defined by the following equation, $H(z) = 1 - a / 1 - a*z^{-1}$,wherein a is the selectable filter coefficient, as taught by Verreault, in order to match the transfer function of the filter to the spectral contents of the analyzed signal.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Martin, III (U.S. Patent 4,132,953) discloses squelch circuit for a radio receiver.

b. Millar (U.S. Patent 4,823,296) discloses first order digital filter with controlled boost/truncate quantizer.

c. Branner et al. (U.S. Patent 6,259,904) discloses fast squelch circuit and method.

d. Zele et al. (U.S. Patent 6,055,421) discloses carrier squelch method and apparatus.

e. Day (U.S. Patent 4,359,780) discloses high speed squelch circuit.

f. Peterson et al. (U.S. Patent 6,397,050) discloses multiband squelch method and apparatus.

g. Andrews (U.S. Patent 3,750,032) discloses priority channel scanning system with dual response time control.

h. Baker (U.S. Patent 5,199,109) discloses multi channel scanning receiver with improved signal strength detecting circuitry.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le
May 27, 2004

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